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(54) METHOD FOR COPYING DATA IN A GRAPHICAL USER INTERFACE

VERFAHREN ZUM DATA KOPIEREN IN EINER GRAFISCHEN BENUTZEROBERFLÄCHE

METHODE POUR COPIER DES DONNEES DANS UNE INTERFACE UTILISATEUR GRAPHIQUE

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(73) Proprietor: **BRITISH TELECOMMUNICATIONS public limited company**
London EC1A 7AJ (GB)

(72) Inventor: **COE, Tobias**
Stowmarket,
Suffolk IP14 6DG (GB)

(74) Representative: **Nash, Roger William**
BT Group Legal
Intellectual Property Department
PP C5A
BT Centre
81 Newgate Street
London EC1A 7AJ (GB)

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Description

[0001] The present invention relates to a method of operating a computer to enable a user to cause the copying of a data item from a first set of data to a second set of data. The method results in the computer providing a user with a graphical user interface and has particular utility in relation to methods of operating a computer to provide a tool for updating a database.

[0002] It is now common for computer programs to control a computer to provide the user with a so-called graphical user interface. The graphical user interface provides a two-way interaction. In a first part of the interaction, the computer generates a display which includes graphical elements which represent data stored by the computer or actions that can be carried out by the computer. In a second part of the interaction, the user uses a marker control device to position a marker displayed on the screen. By positioning the marker over the various graphical elements included in the display and operating the marker control device and/or other input devices, the user is able to indicate which data he wishes to manipulate and how he wishes to manipulate it.

[0003] Some computer programs (e.g. Microsoft® Excel 97 SR-1) are executable to provide a graphical user interface which enables the user to copy a plurality of data items to a corresponding plurality of storage fields. The user can cause such copying to take place by operating one or more input devices firstly to select a group of data item representations, then to move those representations to storage field representations and finally to indicate that the intended destination has been reached. However, copying a selected subset of a group of data items to respective members of a group of storage fields requires many user operations of the input device(s). There is therefore a need to operate a computer so as to allow a user to copy selected data from one set of memory locations to another set more quickly than has hitherto been possible.

[0004] According to a first aspect of the present invention, there is provided a method of operating a computer to enable a user to cause the copying of one or more source data items from a source memory location to one or more storage fields in a storage memory location, said method comprising operating the computer to:

a) generate a display having:

a source group display comprising a plurality of source representations representing respective source data items stored in said source memory location; and

a storage group display comprising a plurality of storage representations representing respective storage fields in the storage memory location;

b) move at least one of said group displays responsive to user commands, wherein the representations of said at least one movable group move substantially as a group,

c) detect the user at least moving one or both of said source and storage display groups to a relative position where there are plural instances where a source representation and a storage representation coincide, thereby making the source data items represented by the source representations involved in said coincidences selectable for being copied to the storage fields represented by the storage representations involved in the coincidences,

said method being characterized by,

in response to said detected movement, further operating said computer to:

d) detect one or more user selections of a source representation representing which of the selectable source data items is to be copied, and

e) responsive to each user selection, copy said selected source data item to the storage field represented by the storage representation involved in the coincidence with the selected source representation.

[0005] The present invention enables a user to copy selected source data items from one set of memory locations to respective selected storage fields in another set of memory locations. The user can cause the items to be copied by positioning a group of source data item representations relative to a group of storage field representations such that one or more of the source data item representations substantially coincide with respective storage field representations. Thus, the user is able to copy selected items of data from one group to another group more quickly and reliably than has hitherto been possible.

[0006] Preferably, said method further comprises the step of operating the computer to perform said copying step only on said user additionally issuing a transfer command. This provides a user interface which results in the user having greater control over whether the copying takes place.

[0007] Furthermore, in preferred embodiments, the method further comprises the step of operating the computer to perform, at least in the event that another source representation coincides with another storage representation, said copying step only on said user additionally selecting which of the source representations is to be copied. This has the advantage that the user can control which items are copied even if the relative spatial arrangement of the source representations and the storage representations is substantially the same.

[0008] In preferred embodiments, said method further comprises the step of operating the computer to display one or both of said groups within a visibly bounded group display area forming a portion of the output display area. By displaying one or both groups of representations in a display area that has a visible boundary, it is clearer to the user which representations belong to which group.

Hence, the user is able to control the copying operation more quickly and reliably. One way of providing a visible boundary is to fill substantially the entire bounded group display area with a background which is distinguishable from other parts of the display. Another way of providing a visible boundary is to display a frame that follows said boundary.

[0009] Where one or both groups of representations is displayed on a distinguishable background, the method preferably further comprises the step of operating the computer to display in said bounded group display area, when said group displays overlap, said background, the source representations and the storage representations. When this feature is provided, the user is more easily able to position one or more data item representations so that they substantially coincide with storage representations.

[0010] In preferred embodiments there is provided a method of operating a computer to enable a user to cause the copying of one or more source data items from a source memory location to one or more destination fields in a destination memory location, said method comprising operating the computer to carry out the steps of any of the above embodiments and thereafter:

a) generate a destination group display comprising a plurality of destination representations representing respective destination fields in the destination part of memory;
b) move said storage group display responsive to user commands, wherein said storage representations move substantially as a group; and
c) copy the storage data item represented by one of said storage representations to the destination field represented by one of said destination representations responsive to said user moving at least one of said storage and destination display groups such that said storage representation and said destination representation substantially coincide.

[0011] This has the advantage that a user can transfer a plurality of items selected from a group of source memory locations to a group of destination memory locations in one movement of the group of storage representations.

[0012] Preferably, said source group display fills substantially the entire output display area, said storage group display generation step thereafter overwrites parts of the source group display and said destination group display generation step overwrites said source group display without overwriting said storage group display.

[0013] This has the advantage that the computer can use substantially the whole display area in displaying the source group and the destination group, without hindering the use of the storage group to transfer data items represented in the source group to destination fields represented in the destination group.

[0014] Any of the above embodiments can be used in operating a computer to provide a database amendment tool. The above embodiments are especially suited to transferring data to and from the unevenly located data fields typical of a graphical representation provided under the control of a database program.

[0015] According to a second aspect of the present invention there is provided a computer readable object directly loadable into the internal memory of a digital computer, said object physically embodying software code portions which control the computer to carry out method steps according to the first aspect of the present invention.

[0016] According to a third aspect of the present invention there is provided an electromagnetic signal physically embodying computer readable code executable by a computer to control said computer to carry out method steps according to the first aspect of the present invention.

[0017] There now follows, by way of example only, a description of specific embodiments of the present invention. The description is given with reference to the accompanying drawings in which:

Figure 1 shows a personal computer;

Figures 2A to 2D show tables of a database stored on the hard disc of the computer;

Figures 3A to 3C show displays created by three respective processes in a database editing program running on the computer;

Figure 4A shows a set of memory locations in the Random Access Memory (RAM) of the personal computer;

Figure 4B shows a display created to help a user copy data items from the database;

Figures 4C and 4D are flow charts that illustrate processes used in provided a data copying method;

Figures 5A to 5D show the screen displays generated in a scenario which demonstrates the use of the data copying method.

[0018] Figure 1 shows an IBM PC 300PL personal computer having a central unit 10, a video monitor 12, a keyboard 14 and a mouse 16. The personal computer comprises well-known hardware components connected together in a conventional manner.

[0019] Known operating system software (e.g. Windows 95) is loaded into the computer's RAM when it is switched on and is executed to provide the user with a known WIMPS (Windows, Icons, Mouse, Pull-Down Menus) user interface.

[0020] A CD-ROM 18 encodes a database editing program which when run on the personal computer causes it to operate in accordance with the present embodiment.

[0021] The hard disc of the computer encodes (in addition to the operating systems, other programs and files) a customer database which is comprised of four tables, namely an index table (Figure 2A), an address table (Figure 2B), an order table (Figure 2C), and an accounts table (Figure 2D). Each of these tables is transferred to the computer's RAM when the database editor program is run.

[0022] The index table (Figure 2A) is held in a first area of the computer's RAM and is divided into sections. As with all the sections, the section 19 relating to, say, Acme Co. Ltd contains a first memory location 20 storing alphanumeric data representing the company name. The memory location 22 following the first memory location 20 stores numeric data representing a customer number associated with Acme Co. Ltd. The following five memory locations 23A to 23E store numeric data representing up to five respective account numbers associated with the company. The last ten memory locations 24A to 24J contain numeric data representing the order numbers associated with the last ten orders received from Acme Co. Ltd. In many cases, the company may not have as many as five account numbers or ten purchase orders associated with it. In those cases, those memory locations which do not contain account or order numbers contain no data.

[0023] A second area of the RAM stores an address table (Figure 2B). The address table (Figure 2B) is divided into sections, each of which relates to one customer number. As with all the sections in the address table, the section 25 relating to Acme Co. Ltd contains the following data in memory locations 26 to 42:

a) customer name (in memory location 26);
b) location (in memory location 28);
c) building (in memory location 30);
d) town (in memory location 32);
e) country (in memory location 34);
f) postcode (in memory location 36);
g) telephone number (in memory location 38);
h) facsimile number (in memory location 40);
i) contact name (in memory location 42).

[0024] A third area of the RAM stores the order table (Figure 2C) which is divided into sections, each of which represents a given order number. As with all the sections in the order table, the section 19 relating to Acme Co. Ltd contains seven memory locations which respectively contain alphanumeric data representing:

a) Customer Name (in memory location 46)
b) Contact Name (in memory location 48)
c) Product Name (in memory location 50)
d) Required by Date (in memory location 52)
e) Charge Type (in memory location 54)
f) Delivery Method (in memory location 56)
g) Level of Service (in memory location 58)

[0025] A fourth area of the RAM stores an accounts table (Figure 2D). As with the other tables, the accounts table is arranged into sections 60. Each section 60 is associated with a given account number and is made up of memory locations storing the following alphanumeric data:

a) Customer Name (in memory location 62)
b) Contact Name (in memory location 64)
c) Current Invoice Date (in memory location 66)
d) Charges Raised (in memory location 68)
e) Telephone Number (in memory location 70)
f) Call Itemisation (in memory location 72)
g) Level of Service (in memory location 74)

[0026] Once the index, address, order and accounts tables have been loaded in the computer's RAM, the database editor program causes the computer to display an enquiry screen which prompts the user to enter a customer name using the keyboard. The index table is then searched to find the section (e.g. 19) of the index data relating to that customer name. Those skilled in the art of database programming will easily be able to generate a suitable arrangement of the index table and search algorithm to achieve the above step.

[0027] Having used the index table (Figure 2A) to find the appropriate customer number (e.g. in memory location 22), the computer displays a customer address window (Figure 3A) which substantially fills the screen of the monitor 12. The customer address window is rectangular in shape and comprises a framing area 80 which surrounds a current address data display area 82. The current address data display area 82 is also rectangular in shape and extends horizontally across from a vertical left-hand boundary 84 close to the left-hand edge of the window to a vertical right-hand boundary 86 close to the right-hand edge. In a vertical direction, the data display area extends upwards from a horizontal lower boundary 88 close to the bottom of the window to an upper horizontal boundary 90 about three-quarters of the way up the window. The framing area has one background colour and the data display area has a different background colour.

[0028] The upper framing area (i.e. the part which lies above the upper horizontal boundary 90), carries four display components. The uppermost display component is a rectangular program title bar 92 which almost fills the uppermost quarter of the upper framing area and has a different colour to the background colour of the framing area. The program title bar 92 itself carries left-justified text 94 which indicates that the database editor program has drawn the window. At its right-hand end the program title bar 92 carries two square buttons 96, 98. The left-hand button 96 carries a picture of a low horizontal bar and the right-hand button 98 carries a picture of a diagonal cross. Immediately below the program title bar 92 is a left-justified series of menu options 96 displayed in text form. Immediately below them the upper frame area

carries a left-justified series of five square buttons (98 to 106). From left to right, the five buttons are labelled with representations of a notepad, a pound sign, a mobile phone, a pen and a house respectively. Immediately below them, nearly all the lowermost quarter of the upper framing area is occupied by a rectangular data display area title bar 108. The rectangular display area title bar is of the same colour as the program title bar 92 and carries at its left-hand end two items of text separated by a hyphen. The left-hand item of text indicates that the data in the data display area 82 has come from the address table (Figure 2B). The right-hand item of text indicates the company name associated with the data displayed in the data display area 82. The right-hand item of text is found in the first memory location (26) of the section (25) whose other contents are displayed in the data display area 82.

[0029] The data display area 82 has nine horizontal display bars (110 to 124) which are arranged into a left-hand column of six display bars (110 to 120) and a right-hand column of two display bars (122, 124). Each of the field display bars (110 to 124) is a white rectangle and displays (although not shown in Figure 3A) the alphanumeric data from a corresponding one of the memory locations (28 to 42) in the section (25) of the address table (Figure 2B) associated with the current customer (in this example, Acme Co. Ltd.). A text label is presented to the left of each of the display bars (110 to 124) which indicates which of the memory locations in the current section have their contents shown in the display bar to the right of the label. In this example the display bar 110 displays the data contained in the 'contact name' memory location (42) of the section (25) of the address table (Figure 2B) that relates to Acme Co. Ltd..

[0030] The display further carries a screen pointer 128, the position of which is controllable by the user using the mouse 16. If the screen pointer 128 coincides with a data display bar 110 to 124 then it is displayed as a thin vertical line, otherwise it is displayed as an arrow. When the address window is first displayed, a flashing cursor appears in the first display bar 110. By manipulating the mouse and the keyboard in a known manner a user is able to edit the contents of the associated memory locations (28 to 42) directly. For example, were the user to 'click on' the display bar 112 and then type 'Floor 2', then the alphanumeric string 'Floor 2' would be entered in the memory location 28 and replace whatever data was already held in that memory location. The changes the user makes in this way are echoed in the display bars 110 to 124.

[0031] A skilled programmer will easily be able to provide computer code executable to generate the display shown in Figure 3A. Also, such a programmer will be able to provide code that gives the user with a graphical user interface allowing the user to amend the contents of the address table via the mouse and keyboard. Furthermore, he or she could generate code which allows to user to control the operation of the program via the buttons 96, 98 and the pull-down menus which depend from the options 96.

[0032] On the user manipulating the mouse to move the screen pointer 128 over the 'mobile phone' button 102 and pressing the left-hand mouse button, the program generates an orders screen (Figure 3B). The program uses the current index data to find the section (44) of the orders table (Figure 2C) which corresponds to the most recent order placed by the current customer. The display of the current order data is then generated in an analogous way to the generation of the display of the address data.

[0033] Analogous operations are carried out when the user clicks on the 'pound sign' button 100 which causes the computer to generate an accounts display (Figure 3C).

[0034] On the user clicking on the 'house' button 106, the program returns to the enquiry screen mentioned above, thereby enabling the user to view and edit the sections of the database which relate to another customer.

[0035] On the user clicking on the 'notepad' icon 98, the program controls the computer to set aside six memory locations (Figure 4A: 150 to 160) in the computer's RAM. Thereafter, the computer updates whatever screen display is currently active by adding a rectangular jotter window 162 (Figure 4B) to the display. The jotter window 162 is approximately square in shape and fills around one fifth of the area of the display screen of the monitor 12 and comprises a framing area 163 which surrounds a current jotter data display area 164. The current jotter data display area 164 is also rectangular in shape and extends horizontally across from a vertical left-hand boundary 166 close to the left-hand edge of the window to a vertical right-hand boundary 168 close to the right-hand edge. In a vertical direction, the data display area extends upwards from a horizontal lower boundary 170 about one eighth of the way up the window to an upper horizontal boundary 172 about seven-eighths of the way up the window. The jotter window framing area 163 is of a background colour which differs from the background colour of the address display data area 82. As will be explained below, the user can control whether the jotter data display area 1 64 is provided with a background or not. When a background is present, it is of a colour that is distinguishable both from the background colour of the address display data area 82 and from the colour of the display bars (110 to 124).

[0036] The upper framing area of the jotter window 162 (i.e. the part which lies above the upper horizontal boundary 172), carries a jotter title bar 174 which almost fills the upper framing area and is of a different colour to the background colour of the framing area. The jotter title bar 174 itself carries an icon 93 and left-justified text 94 which indicate that the jotter process of the database editor program has drawn the window 162. At its right-hand end the title bar 174 carries two square buttons 176, 178. The left-hand button 176 carries a picture of a low horizontal

bar and the right-hand button 178 carries a picture of a diagonal cross.

[0037] The jotter data display area 164 has a column of six rectangular display fields (182 to 192), the four corners of each of which are marked with black right-angles 180. Each of the jotter fields displays (182 to 192) (although not shown in Figure 3A) the alphanumeric data from a corresponding one of the jotter memory locations (Figure 4A: 150 to 160).

[0038] The jotter window 162 behaves like a normal program window in that:

a) the user can move it around the display screen by dragging the jotter title bar 174;

b) the jotter process can be stopped by clicking on the top right-hand button 178, or minimised by clicking on the left-hand button 176; and

c) 'focus' can be shifted to the jotter window 162 by clicking on its title bar 174 - this means that the screen cursor 129 will appear in the most recently amended jotter field 182 to 192, and data entered by the keyboard will be entered into the corresponding memory location (Figure 4A : 150 to 160), and any such amendments will be echoed in the jotter field 182 to 192. As is usual, the fact that 'focus' is currently on the jotter window 162 is illustrated by its title bar 174 being darker than the title bar of the address window. 'Focus' passes to the jotter window 162 when it is first displayed; and

d) If the screen pointer 128 coincides with a jotter field (182 to 192) then it is displayed as a thin vertical line, otherwise it is displayed as an arrow.

[0039] Unlike a normal program window, the jotter window:

a) is not overwritten when 'focus' is shifted back to the address data window (Figure 3A);

b) In addition to the jotter window 162 being 'draggable' by its title bar 174, it is also 'draggable' by any other position within the window;

c) The lower framing area of the jotter window 162 (i.e. the part which lies below the lower horizontal boundary 170), carries an opacity control bar 194 which almost fills the lower framing area and is of the same background colour as the upper framing area 174.

[0040] The opacity control bar 194 carries a visual representation of a slider 196 which is movable between a left-hand end and a right-hand end. By moving the screen pointer 128 over the slider and 'dragging' it to the right-hand end, the user can cause the background of the jotter display area 164 to overwrite the parts of the address screen display that are located within the jotter display area 1 64. In contrast, by dragging the slider 196 to the left-hand end, the user can cause the parts of the address display within the jotter display area to overwrite the background of the jotter display area 164. Text either side of the slider's range is presented to remind the user of its function. When the slider 196 is at a position intermediate its ends, the background jotter data display area 164 overwrites the parts the address data display to a degree controllable by the position of the slider 196. It will be realised that the jotter data (not shown) and the right-angles 180 will always be visible to the user, whereas any items of the address data display will only be visible in the jotter data display area 164 if the slider 196 is away from its rightmost position.

[0041] A skilled programmer will easily be able to write computer code executable to generate a data store in memory (Figure 4A) and a jotter window 1 62 which have the above properties.

[0042] The database editor program also includes a pull_up process (Figure 4C) and a punch_through process (Figure 4D).

[0043] The pull_up process process begins in step 200 if the jotter window 162 is displayed and the user presses CTRL + U on the keyboard 14. The program causes the computer to find the position (step 202) of the screen pointer 128. Once the position has been found, the computer is controlled (in step 204) by the program to determine whether the screen pointer 128 is positioned both within one of the jotter fields (182 to 192) and within one of the table data display bars (e.g. 110 to 124 if the address screen is being shown).

[0044] If the pointer 128 and jotter window 162 are not so positioned, then the pull-up process ends at step 208. On the other hand, if the pointer 128 and jotter window 162 are so positioned, then the contents of the database table data (e.g. the contents of one of the memory locations 28 to 42, 48 to 58, 64 to 74) associated with the display bar (110 to 124) are copied (step 206) to the jotter memory location (Figure 4A : 150 to 160) associated with the jotter field (182 to 192).

[0045] The punch_through process (Figure 4D) begins in step 210 if the jotter window 162 is displayed and the user presses CTRL + D on the keyboard 14. The steps of the punch_through process are identical to those of the pull_up process, save for the copying step. In the punch_through process, the copying step 216 involves copying the contents of the jotter memory location (Figure 4A : 150 to 160) associated with the jotter field (182 to 192) to the database table memory location (e.g. to one of memory locations 28 to 42, 48 to 58, 64 to 74) associated with the display bar (110 to 124).

[0046] An example of how a computer operating in accordance with the present embodiment might be used as a database amendment tool will now be given with reference to Figures 5A to 5D.

[0047] A representative of the company which main-

tains the database, runs the database editing program on their computer so as to cause it to display the enquiry screen on the monitor 12. An employee of a customer (Acme Co. Ltd, say) telephones the company representative and requests that the address details for Acme Co. Ltd are updated. The company representative enters the name 'Acme Co. Ltd' using the computer's keyboard 14. Following the process explained above the computer will then display the contents of the section (25, Figure 2B) of the address table which relates to Acme Co. Ltd. The company representative might then update the contents of that section directly by entering replacement alphanumeric data using the keyboard. The display might then appear as in Figure 5A.

[0048] The Acme Co. Ltd employee might then indicate that invoices and purchases are also to be sent to the same person. Realising that the same information must be entered into a further two parts of the database, the company representative clicks on the jotter icon 98 which, as explained above, causes the jotter window 162 to appear (see Figure 5B) on the screen of the monitor 12.

[0049] Using the mouse 16, the representative then positions the pointer 128 over the first jotter field 182 and drags the jotter window 162 to a position such that the uppermost jotter field 182 is coincident with the top-left display bar 110. The user then enters CTRL + U on his or her keyboard. The process illustrated in Figure 4C is then performed to copy the name the representative has just entered into the relevant memory location 42 of the address table (Figure 2B) of the database to the first jotter field memory location 150. Immediately after that operation the screen will appear as shown in Figure 5C. The representative can issue a similar sequence of commands to cause the telephone number represented in the top-right display bar 122 to be copied to the memory location 152 associated with the second jotter field 184.

[0050] Once the two pieces of address data have been visibly recorded, the representative can click on the 'pound sign' icon 100 to cause the contents of the section 60 of the accounts table (Figure 2D) to be displayed instead of the contents of the address table. The user then moves the jotter window 162 (which is not overwritten in the replacing of the address screen by the accounts screen) to a position where the first jotter field 182 is aligned with the top-left display bar of the accounts table data display window. The display on the monitor 12 might then appear as shown in Figure 5D. By moving the screen pointer over the so aligned jotter field 182 and top-right display bar, and pressing CTRL + D on the keyboard 14, the user causes the punch_through process of Figure 4D to be performed. Data representing the name of the new contact at Acme Co. Ltd. is thereby copied to the appropriate memory location 64 in the accounts table (Figure 2D).

[0051] It will be realised that a similar sequence of operations might then be used to update the appropriate telephone number data in the accounts table (i.e. memory location 70) and also the contact name data in the orders table (i.e. memory location 48).

[0052] It will be seen that the above embodiment enables a user to copy a selected subset of data displayed in, say, the address display window (Figure 3A) to the jotter window 162. Indeed, as the display bars (110 to 120) of that screen and jotter fields (182 to 192) are similarly spaced the user can copy a selected subset of the address data to the jotter memory fields (Figure 4A) without moving the jotter window between copying operations. Such a feature might be especially useful were the computer to be displaying the contents in the form of a table or a spreadsheet.

[0053] It will also be seen how the display of a combination of both the jotter window 162 and the address, accounts, or order display allows the user to copy data from one of the tables (Figure 2A, 2B, 2C) to another without losing sight of the jotter data whilst nevertheless allowing the address, order and accounts displays to substantially fill the screen of the monitor 12.

[0054] It should be noted that the jotter window could lack the right angles 180, the user, for example, knowing that six equally spaced fields are present and aligning the fields and display bars accordingly.

[0055] The jotter data display area 164 might display only the right-angles 180 and jotter data and not include any part of the display relating to the address, accounts or order display. Even though the display bars (110 to 124) would then not be visible in the jotter window 162, the user would still be able to position the window correctly by aligning the display bar label (126, Figure 3A for example) with the jotter field to which he or she wished the data to be copied.

Claims

1. A method of operating a computer to enable a user to cause the copying of one or more source data items from a source memory location (28-42, 48-58, 64-74) to one or more storage fields in a storage memory location (150-160), said method comprising operating the computer to:

   a) generate a display having:

      a source group display comprising a plurality of source representations (110-124) representing respective source data items stored in said source memory location (28-42, 48-58, 64-74); and
      a storage group display (162) comprising a plurality of storage representations (182-192) representing respective storage fields in the storage memory location (150-160);

   b) move at least one of said group displays (162) responsive to user commands, wherein the rep-

resentations of said at least one movable group move substantially as a group,
c) detect the user at least moving one or both of said source and storage display groups to a relative position where there are plural instances where a source representation and a storage representation coincide, thereby making the source data items represented by the source representations involved in said coincidences selectable for being copied to the storage fields represented by the storage representations involved in the coincidences,
said method being **characterized by**,
in response to said detected movement, further operating said computer to:
d) detect one or more user selections of a source representation representing which of the selectable source data items is to be copied, and
e) responsive to each user selection, copy said selected source data item to the storage field represented by the storage representation involved in the coincidence with the selected source representation.

2. A method according to claim 1 further comprising the step of operating the computer to perform said copying step only on said user additionally issuing a transfer command.

3. A method according to claim 1 further comprising the step of operating the computer to display one or both of said groups within a bounded group display area (162) forming a portion of the output display area.

4. A method according to claim 3 further comprising the step of operating the computer to fill substantially the entire bounded group display area (162) with a background which is distinguishable from other parts of the display.

5. A method according to claim 4 further comprising the step of operating the computer to display in said bounded group display area (162), when said group displays overlap, said background, the source representations (110-124) and the storage representations (182-192).

6. A method according to claim 3 or 4 wherein a border of said group display area (162) is indicated by a frame (80,163) that follows said border.

7. A method according to claim 1 further comprising

f) generating a destination group display comprising a plurality of destination representations (110-124) representing respective destination fields in the destination part of memory;
wherein said storage group display (162) is movable by the user and said storage representations (182-192) move substantially as a group; and
g) copying the storage data items represented by one of said storage representations (182-192) to the destination field represented by one of said destination representations (110-124) responsive to said user moving at least one of said storage and destination display groups such that said storage representation and said destination representation substantially coincide.

8. A method according to claim 7 wherein:

said source group display fills substantially the entire output display area;
said storage group display generation step thereafter overwrites parts of the source group display ; and
said destination group display generation step overwrites said source group display without overwriting said storage group display (162).

9. A method of operating a computer to provide a database amendment tool which method comprises the steps of any preceding claim.

10. A computer readable object directly loadable into the internal memory of a digital computer, said object physically embodying software code portions which control the computer to operate in accordance with the method of any preceding claim.

11. An electromagnetic signal physically embodying computer readable code executable by a computer to control said computer to operate in accordance with the method of any one of claims 1 to 10.

Patentansprüche

1. Verfahren zum Betreiben eines Computers, um einem Anwender zu ermöglichen, das Kopieren eines oder mehrerer Quelldatenelemente von einer Quellspeicherstelle (28-42, 48-58, 64-74) in ein oder mehrere Ablagefelder an einer Ablagespeicherstelle (150-160) zu veranlassen, wobei das Verfahren das Betreiben des Computers umfasst, damit er

a) eine Anzeige erzeugt, die umfasst:

eine Quellgruppenanzeige, die mehrere Quelldarstellungen (110-124) umfasst, die entsprechende Quelldatenelemente repräsentieren, die an der Quellspeicherstelle (28-42, 48-58, 64-74) abgelegt sind; und

eine Ablagegruppenanzeige (162), die mehrere Ablagedarstellungen (182-192) aufweist, die entsprechende Ablagefelder an der Ablagespeicherstelle (150-160) repräsentieren;

b) wenigstens eine der Gruppenanzeigen (162) in Reaktion auf Anwenderbefehle bewegt, wobei sich die Darstellungen der wenigstens einen beweglichen Gruppe im Wesentlichen als eine Gruppe bewegen,

c) erfasst, dass der Anwender die Quell- und/oder Ablageanzeigegruppen an eine relative Position bewegt, an der mehrere Instanzen vorhanden sind, in denen eine Quelldarstellung und eine Ablagedarstellung übereinstimmen, wodurch die Quelldatenelemente, die durch die Quelldarstellungen repräsentiert werden, die unter die Übereinstimmungen fallen, auswählbar gemacht werden, um in die Ablagefelder kopiert zu werden, die durch die Ablagedarstellungen repräsentiert werden, die unter die Übereinstimmungen fallen,

wobei das Verfahren **dadurch gekennzeichnet ist, dass** es

in Reaktion auf die erfasste Bewegung den Computer ferner so betreibt, dass er:

d) eine oder mehrere Anwenderauswahlen einer Quelldarstellung erfasst, die jene der auswählbaren Quelldatenelemente repräsentiert, die kopiert werden sollen, und

e) in Reaktion auf jede Anwenderauswahl das ausgewählte Quelldatenelement in jenes Ablagefeld kopiert, das durch die Ablagedarstellung repräsentiert wird, die unter die Übereinstimmung mit der ausgewählten Quelldarstellung fällt.

2. Verfahren nach Anspruch 1, das ferner den Schritt des Betreibens des Computers umfasst, damit er den Kopierschritt nur bei dem Anwender ausführt, der zusätzlich einen Übertragungsbefehl ausgibt.

3. Verfahren nach Anspruch 1, das ferner den Schritt des Betreibens des Computers umfasst, damit er die eine oder beide Gruppen innerhalb eines begrenzten Gruppenanzeigebereichs (162), der einen Teil des Ausgabeanzeigebereichs bildet, anzeigt.

4. Verfahren nach Anspruch 3, das ferner den Schritt des Betreibens des Computers umfasst, damit er im Wesentlichen den gesamten begrenzten Gruppenanzeigebereich (162) mit einem Hintergrund ausfüllt, der von den anderen Teilen der Anzeige unterscheidbar ist.

5. Verfahren nach Anspruch 4, das ferner den Schritt des Betreibens des Computers umfasst, damit er in dem begrenzten Gruppenanzeigebereich (162) dann, wenn die Gruppenanzeigen überlappen, den Hintergrund, die Quelldarstellungen (110-124) und die Ablagedarstellungen (182-192) anzeigt.

6. Verfahren nach Anspruch 3 oder 4, bei dem ein Rand des Gruppenanzeigebereichs (162) durch einen dem Rand folgenden Rahmen (80, 163) angegeben wird.

7. Verfahren nach Anspruch 1, das ferner umfasst:

f) Erzeugen einer Zielgruppenanzeige, die mehrere Zieldarstellungen (110-124) umfasst, die entsprechende Zielfelder in dem Zielabschnitt des Speichers repräsentieren;

wobei die Ablagegruppenanzeige (162) durch den Anwender bewegt werden kann und die Ablagedarstellungen (182-192) sich im Wesentlichen als eine Gruppe bewegen; und

g) Kopieren der Ablagedatenelemente, die durch eine der Ablagedarstellungen (182-192) repräsentiert werden, in das Zielfeld, das durch eine der Zieldarstellungen (110-124) repräsentiert wird, in Reaktion darauf, dass der Anwender die Ablage- und/oder Zielanzeigegruppen in der Weise bewegt, dass die Ablagedarstellung und die Zieldarstellung im Wesentlichen übereinstimmen.

8. Verfahren nach Anspruch 7, bei dem:

die Quellgruppenanzeige im Wesentlichen den gesamten Ausgabeanzeigebereich füllt;

der Ablagegruppenanzeige-Erzeugungsschritt danach Teile der Quellgruppenanzeige überschreibt; und

der Zielgruppenanzeigen-Erzeugungsschritt die Quellgruppenanzeige überschreibt, ohne die Ablagegruppenanzeige (162) zu überschreiben.

9. Verfahren zum Betreiben eines Computers, um ein Datenbankänderungswerkzeug zu schaffen, wobei das Verfahren die Schritte nach einem vorhergehenden Anspruch umfasst.

10. Computerlesbares Objekt, das direkt in den internen Speicher eines digitalen Computers geladen werden kann, wobei das Objekt physikalisch Softwarecode-Abschnitte verkörpert, die den Computer so steuern, dass er in Übereinstimmung mit dem Verfahren nach einem vorhergehenden Anspruch arbeitet.

11. Elektromagnetisches Signal, das physikalisch computerlesbaren Code verkörpert, der von einem Computer ausführbar ist, um den Computer so zu steuern, dass er gemäß dem Verfahren nach einem der

Ansprüche 1 bis 10 arbeitet.

Revendications

1. Procédé d'exploitation d'un calculateur pour permettre à un utilisateur de faire copier un ou plusieurs éléments de données source depuis un endroit de mémoire source (28-42, 48-58, 64-74) vers un ou plusieurs champs de stockage dans un endroit de mémoire de stockage (150-160), le procédé comprenant les étapes pour faire que le calculateur :

   a) engendre un affichage ayant :

      un affichage de groupes de sources comprenant une pluralité de représentations de sources (110-124) représentant des éléments de données de sources respectifs stockés dans le dit endroit de mémoire source (28-42, 48-58, 64-74), et
      un affichage de groupes de stockages (162) comprenant une pluralité de représentations (182-192) représentant des champs de stockage respectifs dans l'endroit de mémoire de stockage (150-160),

   b) déplace au moins l'un des dits affichages de groupe (162) en réponse à des commandes de l'utilisateur, et où les représentations du dit au moins un groupe mobile se déplacent sensiblement comme un groupe,
   c) détecte que l'utilisateur déplace au moins l'un ou les deux groupes d'affichage de sources et de stockages à une position relative dans laquelle se trouvent plusieurs instances où une représentation de source et une représentation de stockage coïncident, faisant que les éléments de données de source représentés par les représentations de source impliqués dans ces coïncidences peuvent être sélectionnés pour être copiés dans les champs de stockage représentés par les représentations de stockage impliquées dans les coïncidences,
   le procédé étant **caractérisé par le fait que**
   en réponse au dit mouvement détecté, on commande en outre le calculateur pour qu'il
   d) détecte une ou plusieurs sélections d'une représentation de source représentant lequel des éléments de données de source sélectionnables doit être copié, et
   e) en réponse à chaque sélection de l'utilisateur, copie le dit élément de données de source sélectionné dans le champ de stockage représenté par la représentation de stockage impliquée dans la coïncidence avec la représentation de source sélectionnée.

2. Procédé selon la revendication 1, comprenant en outre l'étape consistant à commander le calculateur pour qu'il n'effectue l'étape de copie que si l'utilisateur émet en plus une commande de transfert.

3. Procédé selon la revendication 1, comprenant en outre l'étape consistant à faire fonctionner le calculateur pour qu'il affiche l'un ou les deux dits groupes à l'intérieur d'une zone d'affichage de groupe limitée (162) formant une partie de la zone d'affichage de sortie.

4. Procédé selon la revendication 3, comprenant en outre l'étape consistant à faire fonctionner le calculateur pour qu'il remplisse sensiblement toute la zone limitée d'affichage de groupe (162) par un arrière-plan qui est discernable par rapport à d'autres parties de l'affichage.

5. Procédé selon la revendication 4, comprenant en outre l'étape consistant à faire fonctionner le calculateur pour que, lorsque les dits affichages se recouvrent, il affiche, dans la dite zone limitée d'affichage de groupes (162), le dit arrière-plan, les représentations de sources (110-124) et les représentations de stockages (182-192).

6. Procédé selon l'une des revendications 3 et 4, dans lequel une limite de la dite zone d'affichage de groupe (162) est indiquée par un cadre (80, 163) qui suit la dite limite.

7. Procédé selon la revendication 1, comprenant en outre le fait de :

   f) engendrer un affichage de groupe de destination comprenant une pluralité de représentations de destination (110-124) représentant des champs de destination respectifs dans la partie destination de la mémoire,
   et où le dit affichage de groupe de stockage (162) peut être déplacé par l'utilisateur et les dites représentations de stockage (182-192) se déplacent sensiblement comme un groupe, et
   g) copier les éléments de données de stockage représentés par l'une des dites représentations de stockage (182-192) dans le champ de destination représenté par l'une des dites représentations de destination (110-124) en réponse afin que le dit utilisateur déplace au moins l'un des dits groupes de stockage et de destination de sorte que la dite représentation de stockage et la dite représentation de destination coïncident sensiblement.

8. Procédé selon la revendication 7, dans lequel :

   le dit affichage de groupe source remplit sensi-

blement toute la zone d'affichage de sortie,
la dite étape de génération d'affichage de groupes de stockages écrit ensuite par-dessus des parties de l'affichage de groupe source, et
la dite étape de génération d'affichage de groupes de destinations écrit par-dessus le dit affichage de groupes de sources sans écrire par-dessus le dit affichage de groupes de stockages (162).

9. Procédé de commande d'un calculateur pour fournir un outil d'amélioration de base de données, le procédé comprenant les étapes de l'une quelconque des revendications précédentes.

10. Objet pouvant être lu par un calculateur, directement chargeable dans la mémoire interne d'un calculateur numérique, le dit objet comportant physiquement des portions de code de logiciel commandant au calculateur de fonctionner selon le procédé de l'une quelconque des revendications précédentes.

11. Code, pouvant être lu par un calculateur, contenant physiquement un signal électromagnétique, pouvant être exécuté par un calculateur pour commander au dit calculateur de fonctionner selon le procédé de l'une quelconque des revendications 1 à 10.

Fig.1.

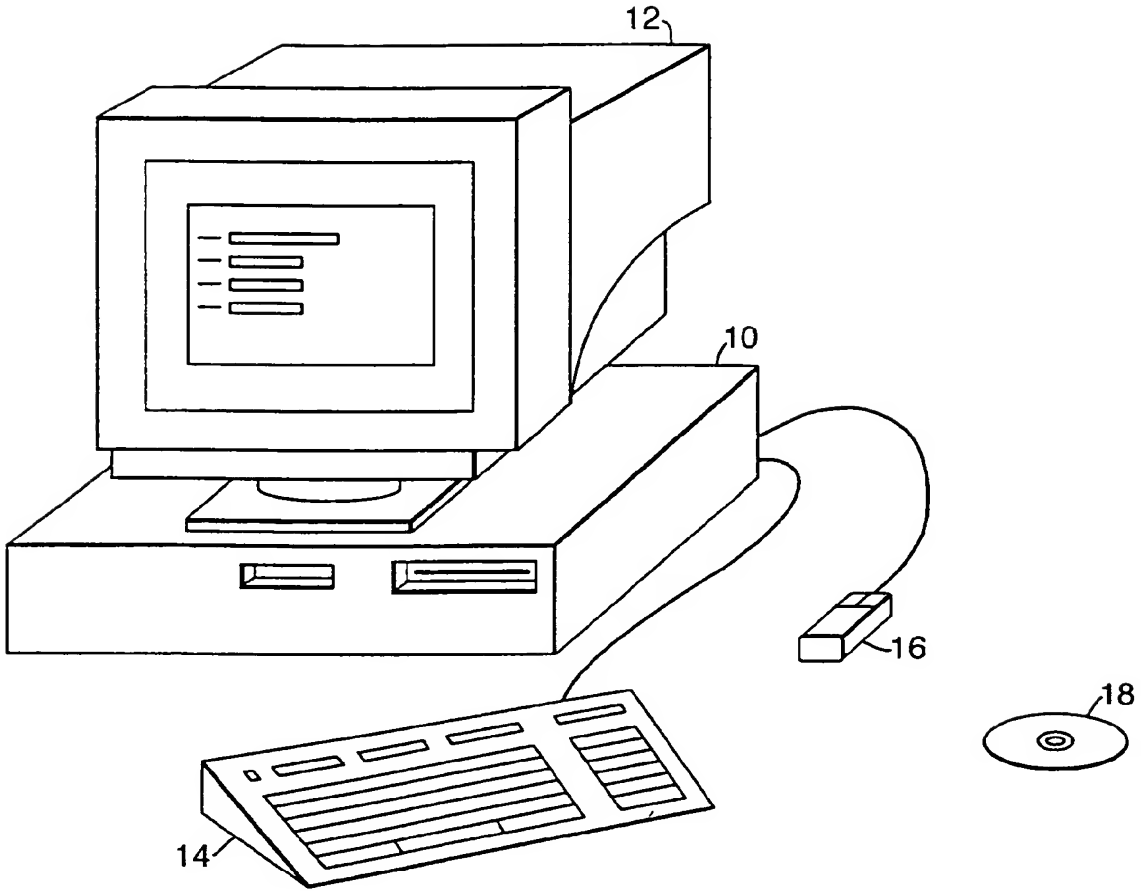


Fig.2A.

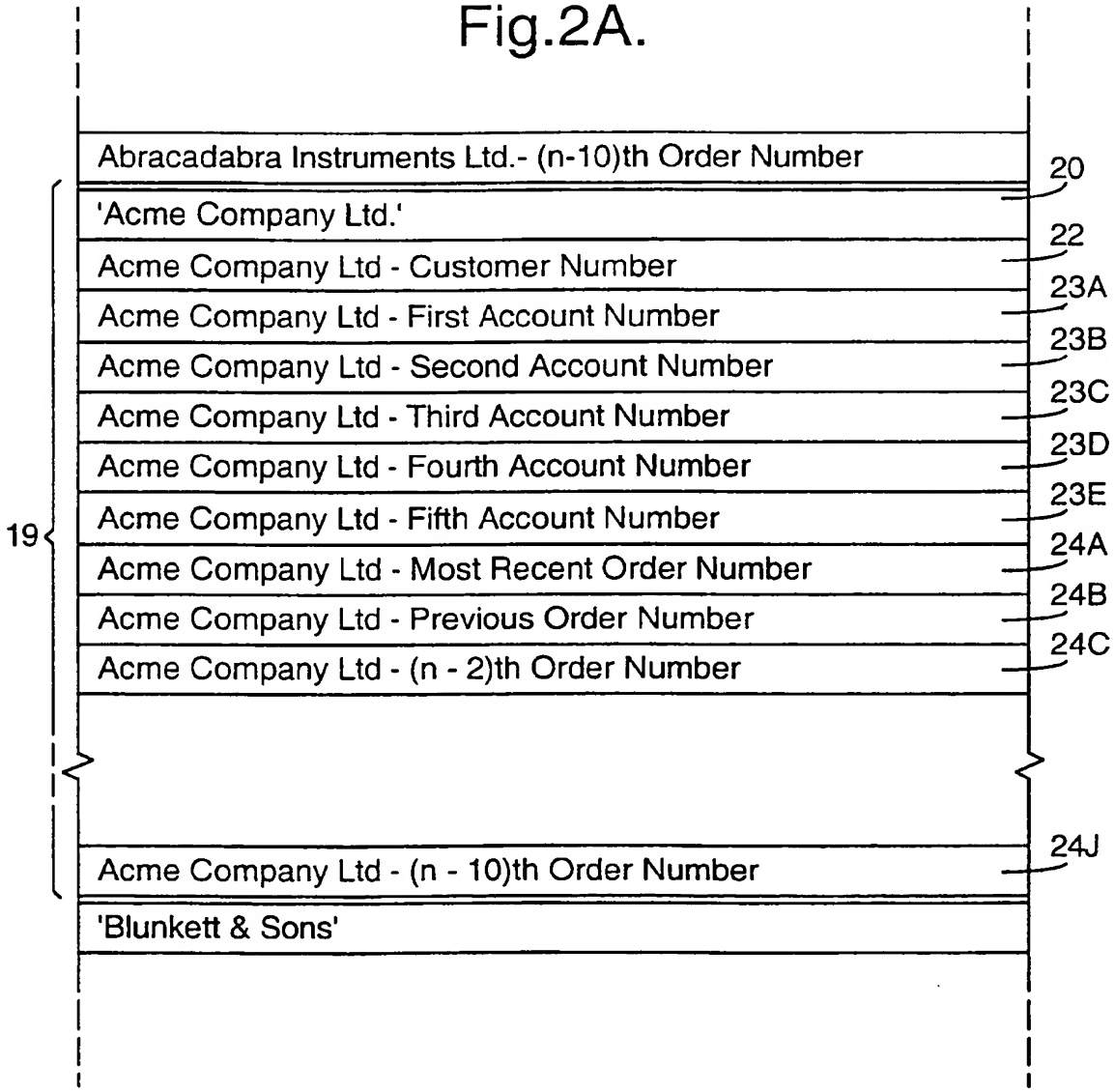

Abracadabra Instruments Ltd.- (n-10)th Order Number
20
'Acme Company Ltd.'
22
Acme Company Ltd - Customer Number
23A
Acme Company Ltd - First Account Number
23B
Acme Company Ltd - Second Account Number
23C
Acme Company Ltd - Third Account Number
23D
Acme Company Ltd - Fourth Account Number
23E
Acme Company Ltd - Fifth Account Number
19
24A
Acme Company Ltd - Most Recent Order Number
24B
Acme Company Ltd - Previous Order Number
24C
Acme Company Ltd - (n - 2)th Order Number
24J
Acme Company Ltd - (n - 10)th Order Number
'Blunkett & Sons'

Fig.2B.

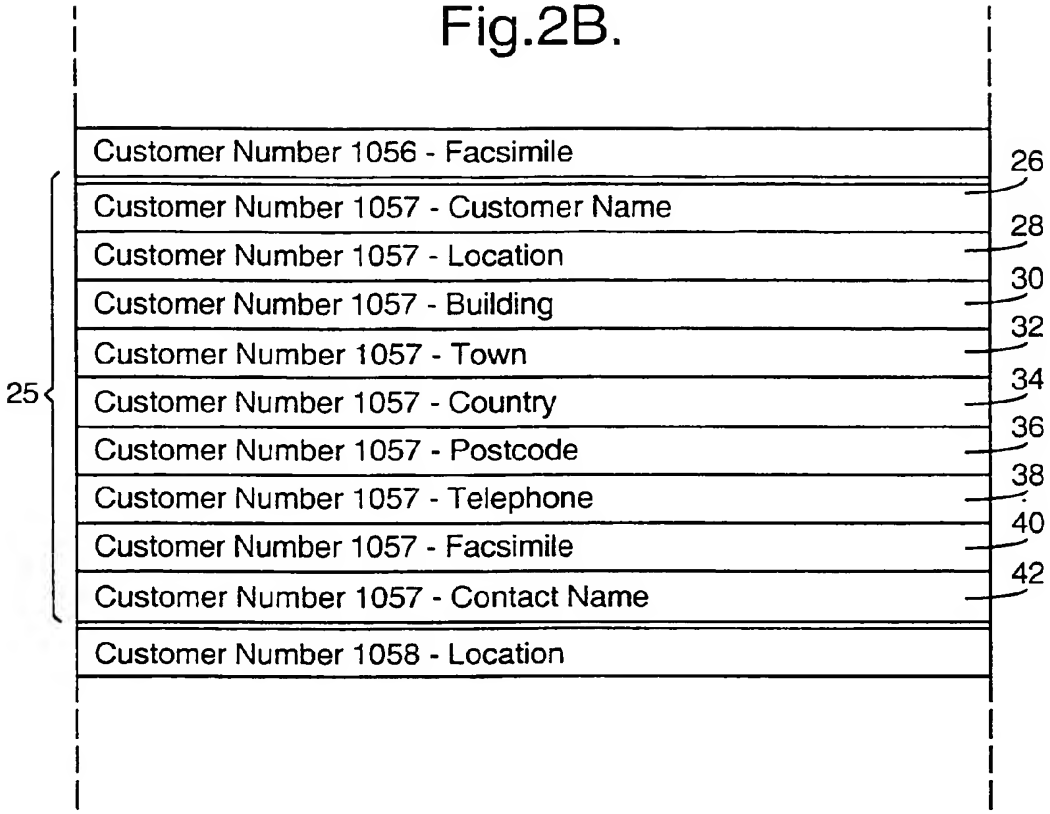

Customer Number 1056 - Facsimile
26
Customer Number 1057 - Customer Name
28
Customer Number 1057 - Location
30
Customer Number 1057 - Building
32
Customer Number 1057 - Town
25
34
Customer Number 1057 - Country
36
Customer Number 1057 - Postcode
38
Customer Number 1057 - Telephone
40
Customer Number 1057 - Facsimile
42
Customer Number 1057 - Contact Name
Customer Number 1058 - Location

Fig.2C.

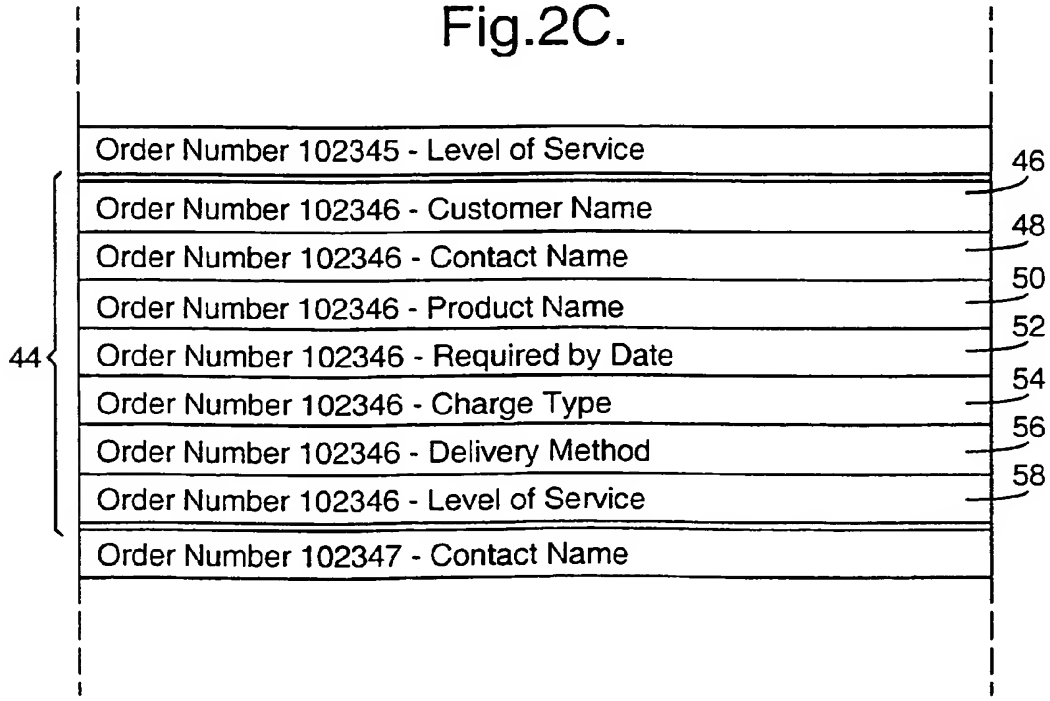

Order Number 102345 - Level of Service
46
Order Number 102346 - Customer Name
48
Order Number 102346 - Contact Name
50
Order Number 102346 - Product Name
44
52
Order Number 102346 - Required by Date
54
Order Number 102346 - Charge Type
56
Order Number 102346 - Delivery Method
58
Order Number 102346 - Level of Service
Order Number 102347 - Contact Name

Fig.2D.

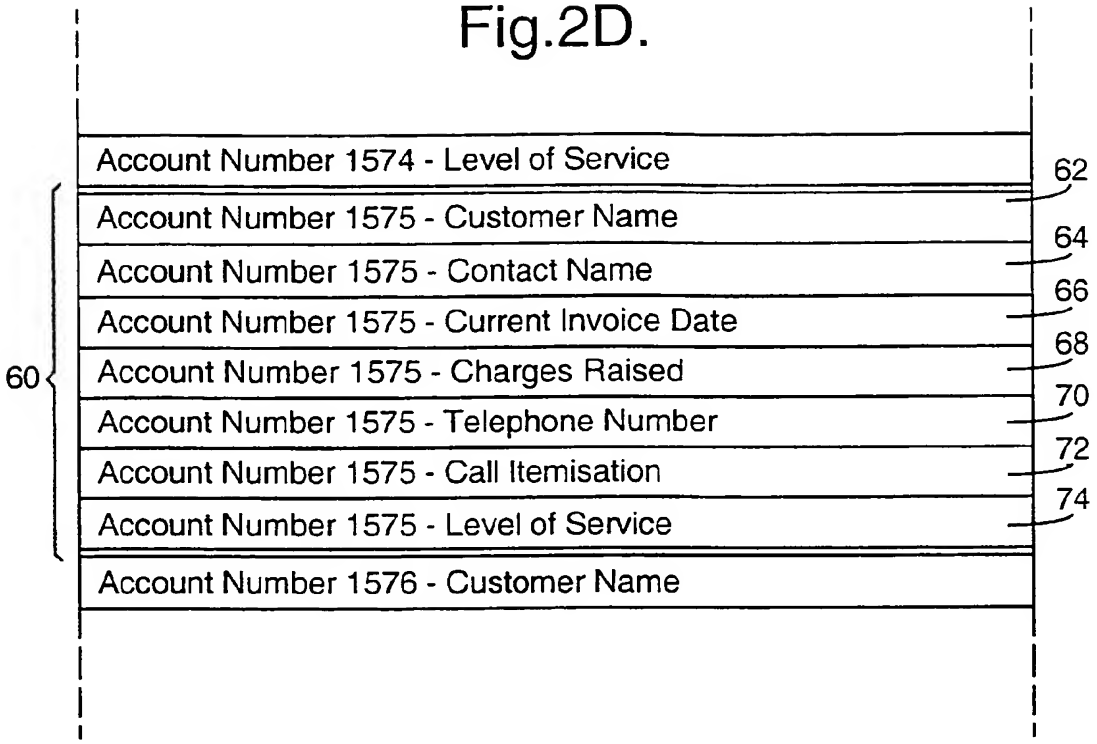

Account Number 1574 - Level of Service
62
Account Number 1575 - Customer Name
64
Account Number 1575 - Contact Name
66
Account Number 1575 - Current Invoice Date
68
60
Account Number 1575 - Charges Raised
70
Account Number 1575 - Telephone Number
72
Account Number 1575 - Call Itemisation
74
Account Number 1575 - Level of Service
Account Number 1576 - Customer Name

Fig.4A.

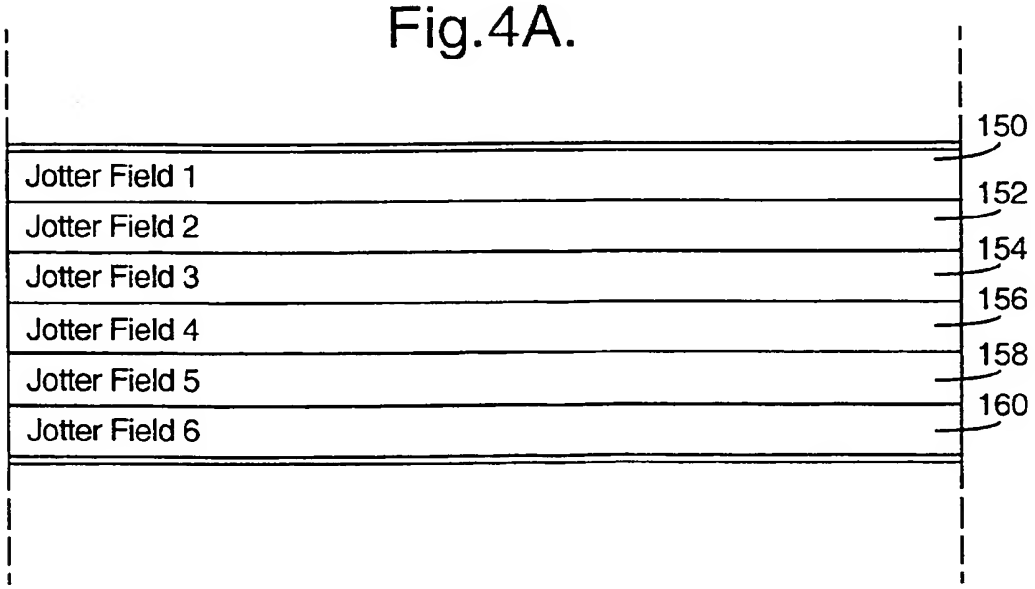

150
Jotter Field 1
152
Jotter Field 2
154
Jotter Field 3
156
Jotter Field 4
158
Jotter Field 5
160
Jotter Field 6

Fig.3A.

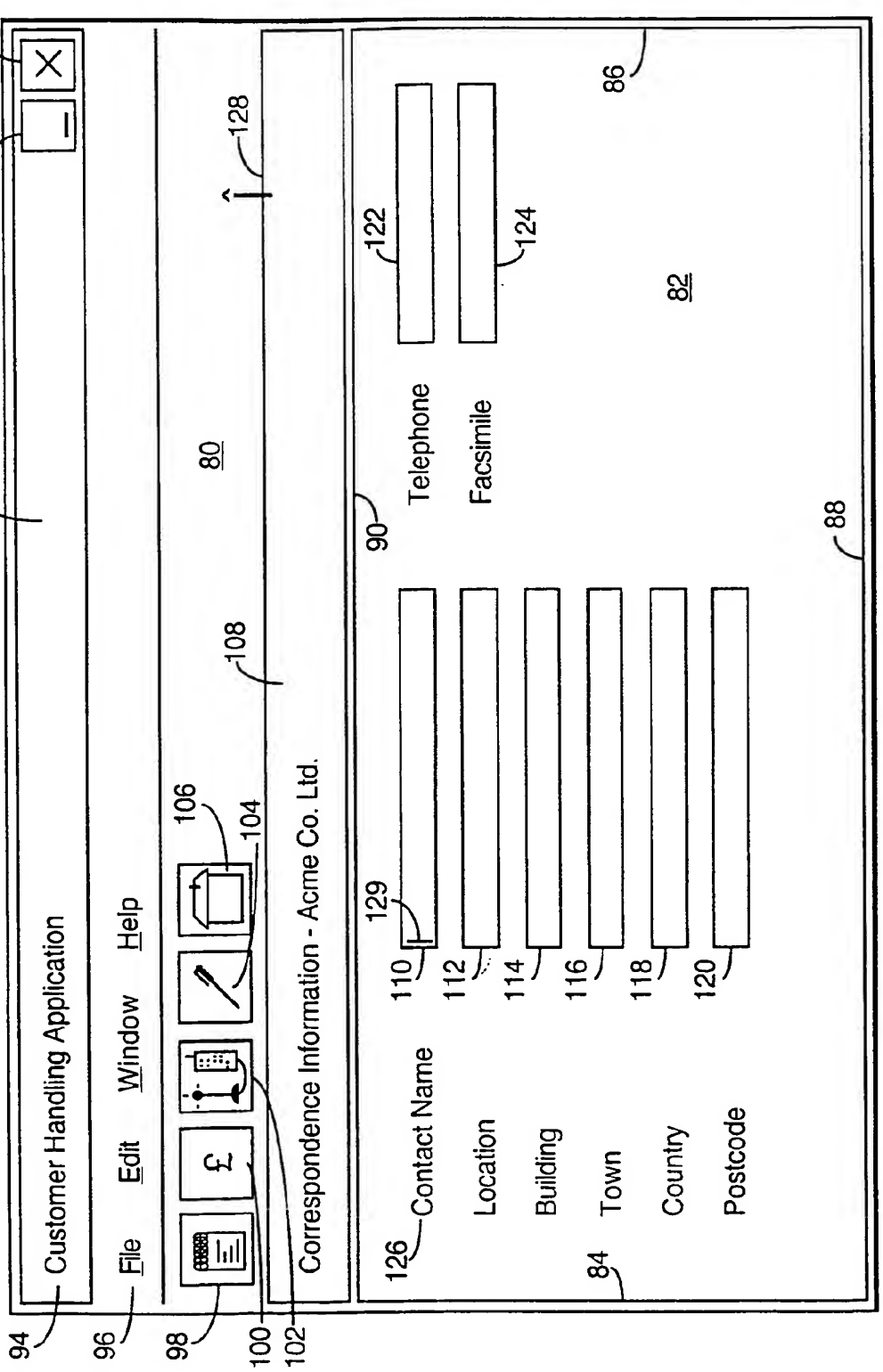

Customer Handling Application
File
Edit
Window
Help
Correspondence Information - Acme Co. Ltd.
Contact Name
Location
Building
Town
Country
Postcode
Telephone
Facsimile
80
82
84
86
88
90
92
94
96
98
100
102
104
106
108
110
112
114
116
118
120
122
124
126
128
129

Fig.3B.

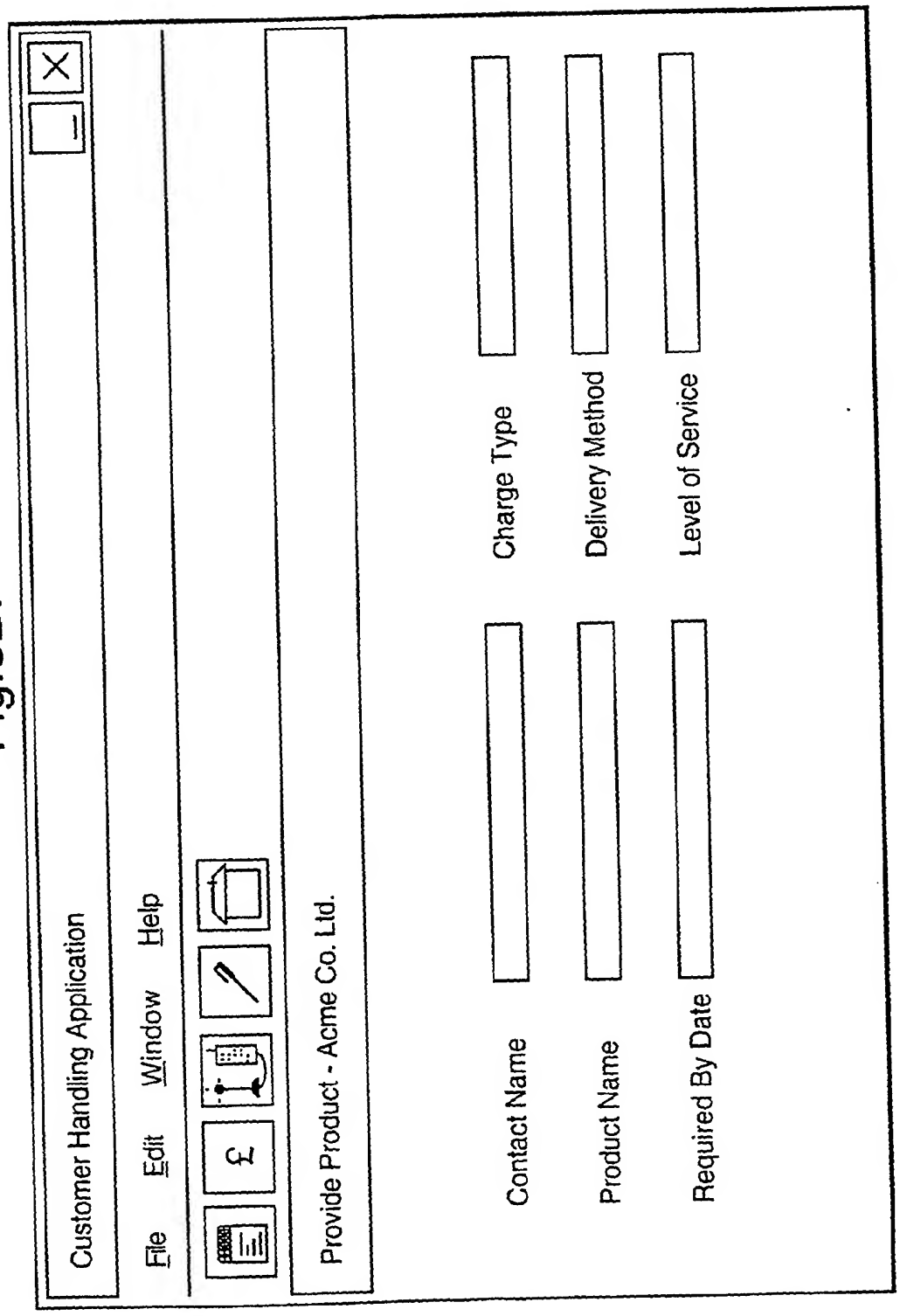

Customer Handling Application
File Edit Window Help
Provide Product - Acme Co. Ltd.
Contact Name
Charge Type
Product Name
Delivery Method
Required By Date
Level of Service

Fig.3C.

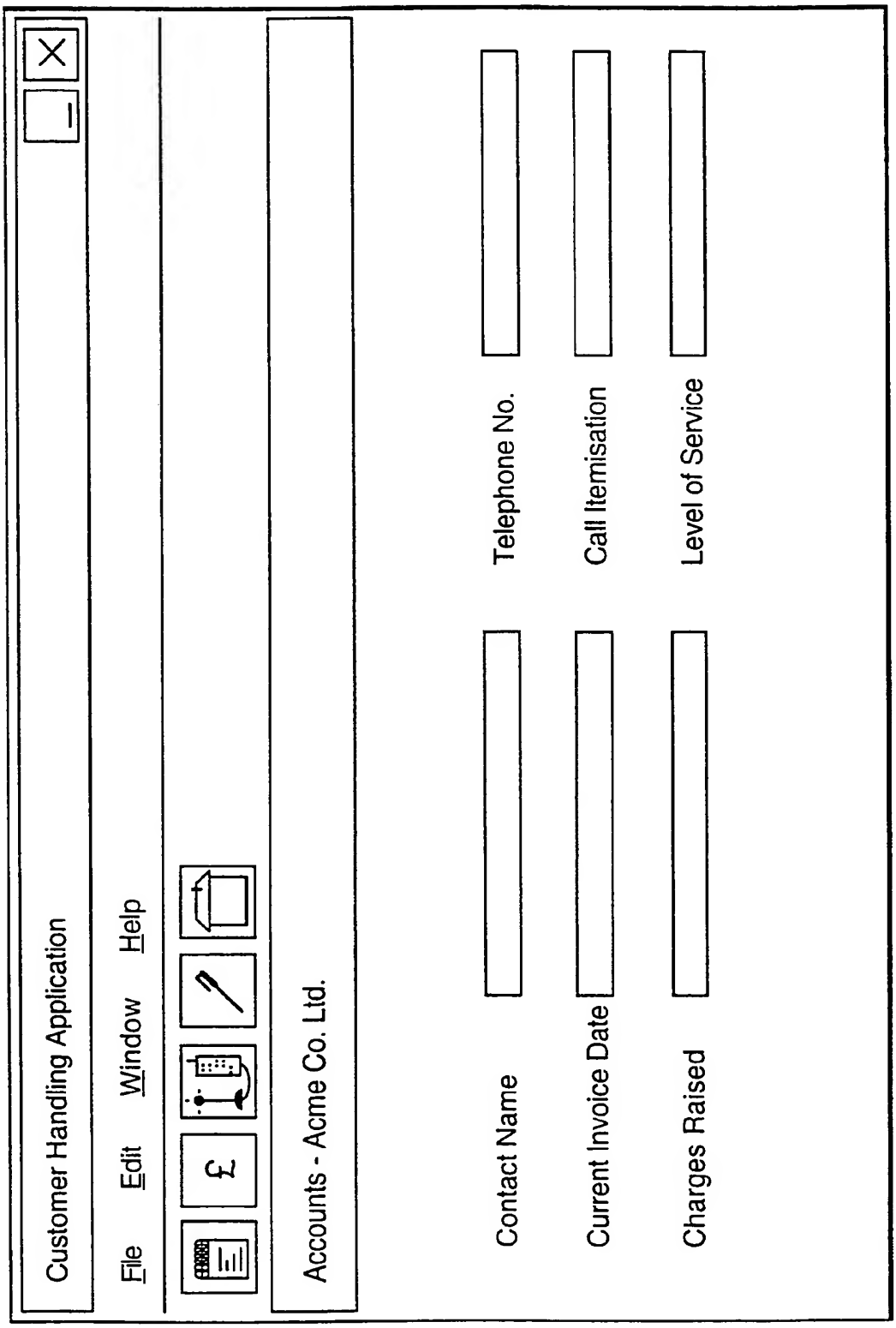

Customer Handling Application
File
Edit
Window
Help
£
Accounts - Acme Co. Ltd.
Contact Name
Telephone No.
Current Invoice Date
Call Itemisation
Charges Raised
Level of Service

Fig.4B.

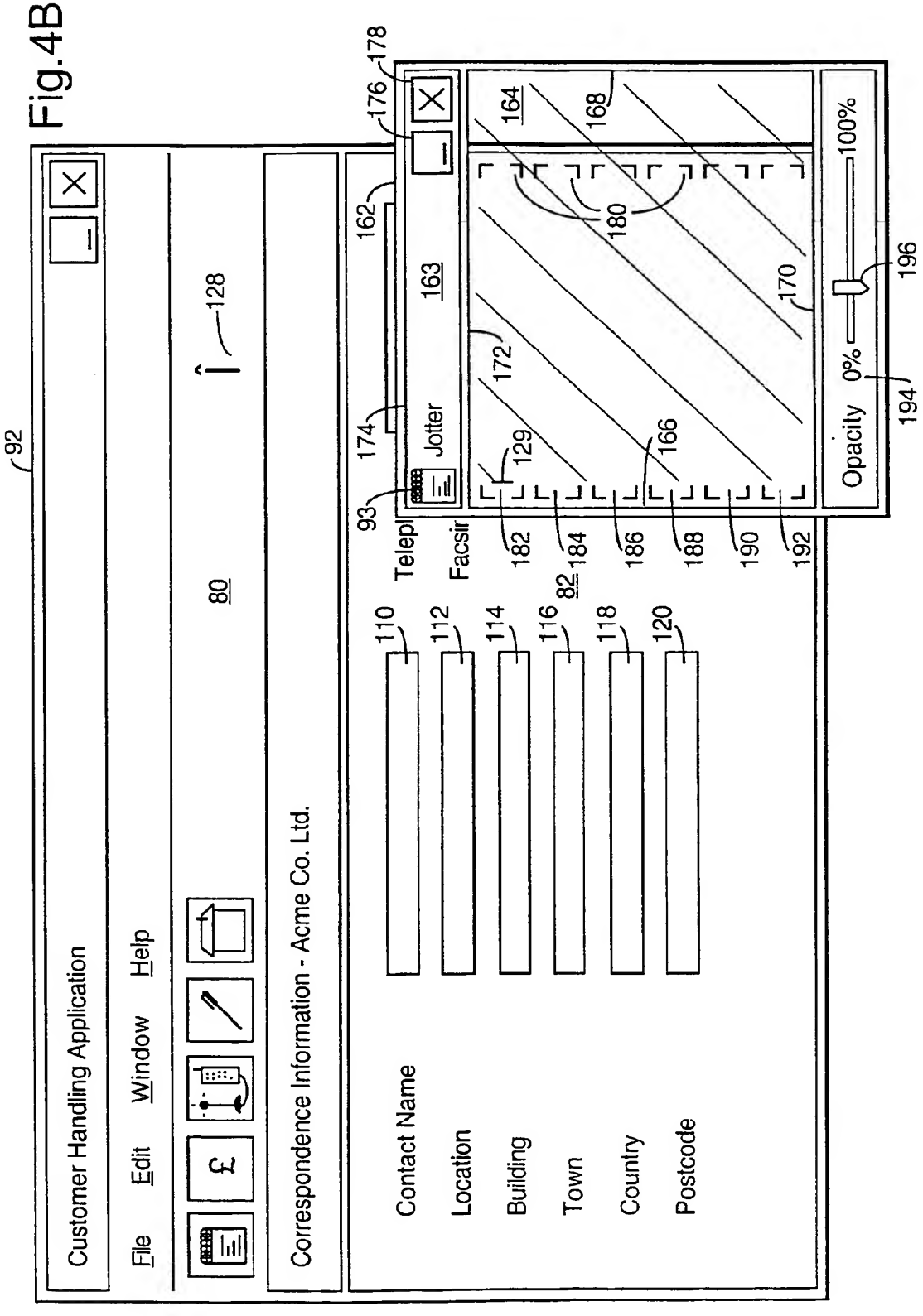

92
Customer Handling Application
File Edit Window Help
£
128
80
Correspondence Information - Acme Co. Ltd.
Contact Name
Location
Building
Town
Country
Postcode
110
112
114
116
118
120
82
93
174
162
176
178
Telepl
Jotter
163
Facsir
164
168
180
172
129
166
170
182
184
186
188
190
192
Opacity 0%
100%
194
196

Fig.4C.

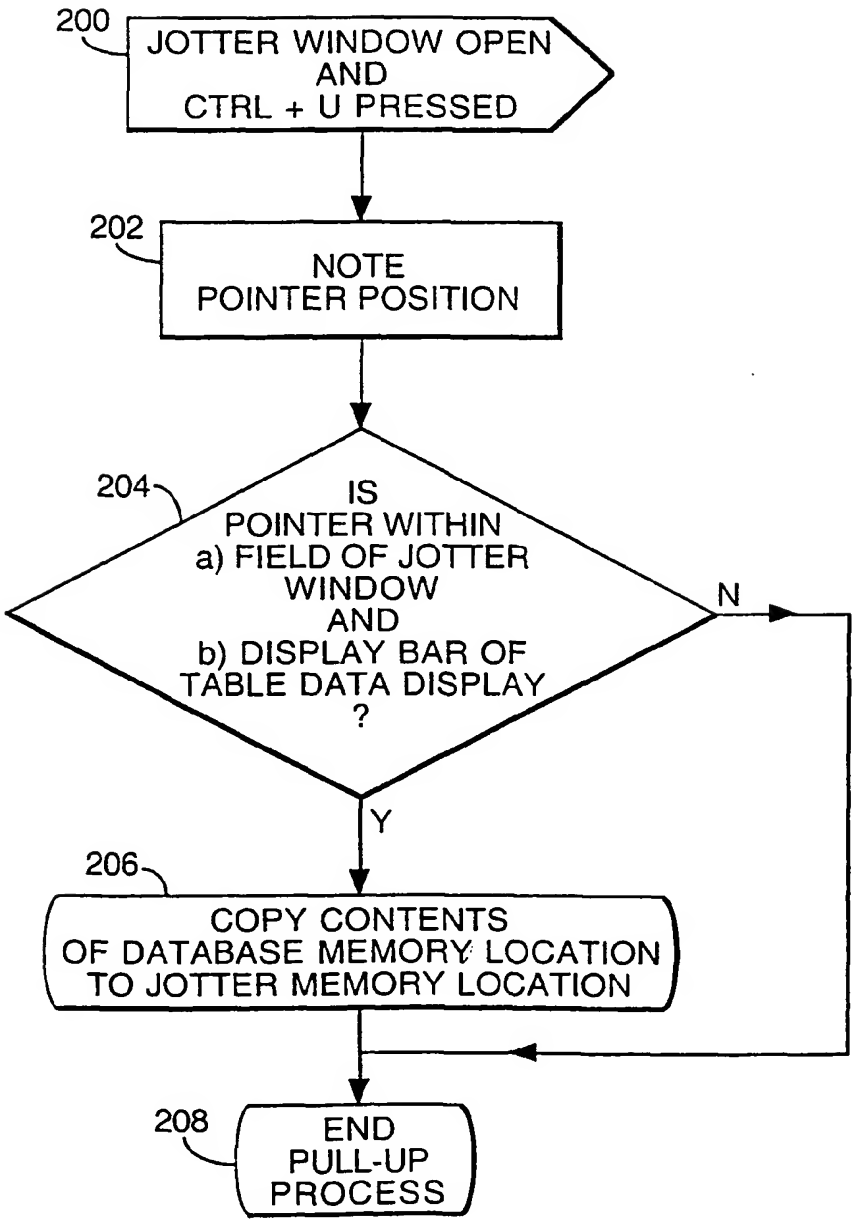

200
JOTTER WINDOW OPEN AND CTRL + U PRESSED
202
NOTE POINTER POSITION
204
IS POINTER WITHIN a) FIELD OF JOTTER WINDOW AND b) DISPLAY BAR OF TABLE DATA DISPLAY ?
N
Y
206
COPY CONTENTS OF DATABASE MEMORY LOCATION TO JOTTER MEMORY LOCATION
208
END PULL-UP PROCESS

Fig.4D.

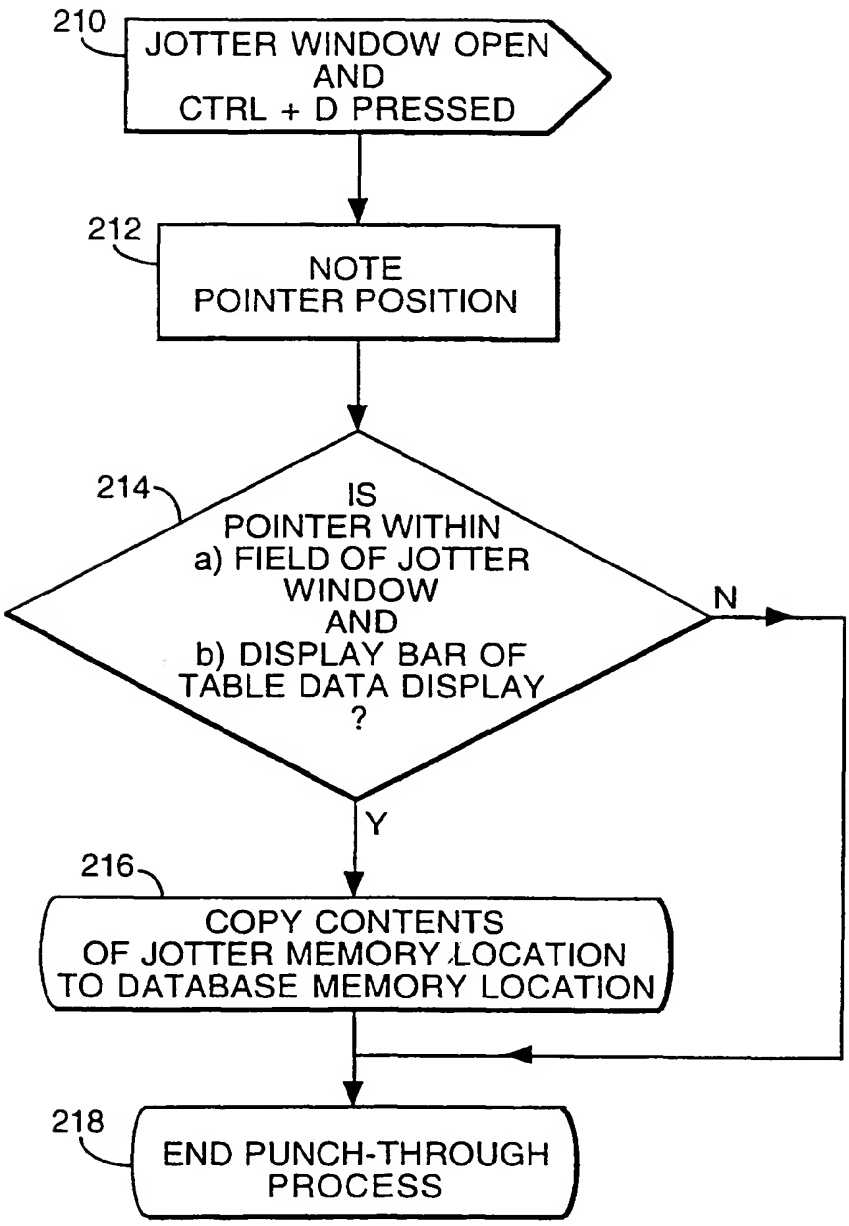

210
JOTTER WINDOW OPEN AND CTRL + D PRESSED
212
NOTE POINTER POSITION
214
IS POINTER WITHIN a) FIELD OF JOTTER WINDOW AND b) DISPLAY BAR OF TABLE DATA DISPLAY ?
N
Y
216
COPY CONTENTS OF JOTTER MEMORY LOCATION TO DATABASE MEMORY LOCATION
218
END PUNCH-THROUGH PROCESS

Fig.5A.

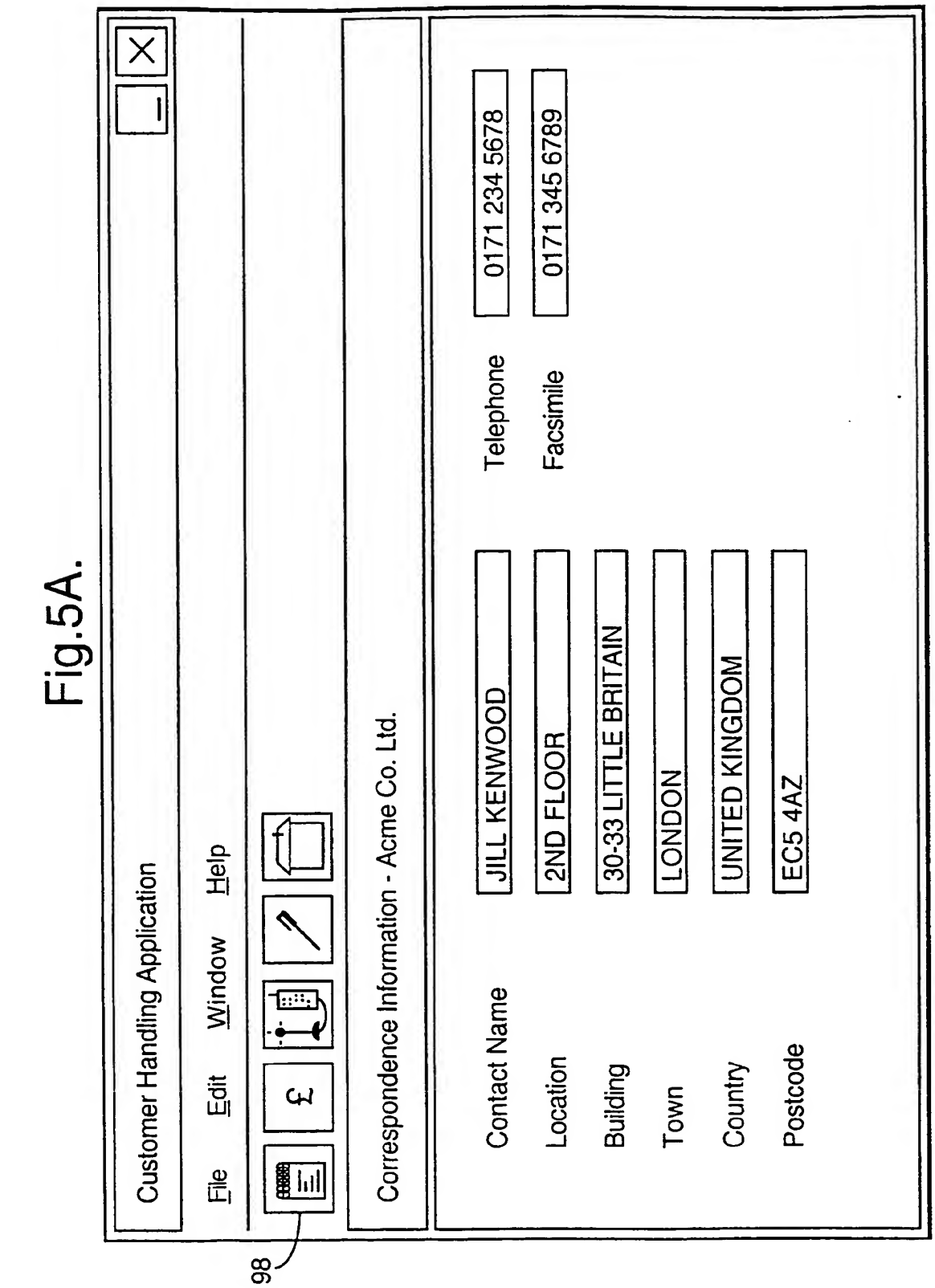

Customer Handling Application
File Edit Window Help
98
Correspondence Information - Acme Co. Ltd.
Contact Name
JILL KENWOOD
Telephone
0171 234 5678
Location
2ND FLOOR
Facsimile
0171 345 6789
Building
30-33 LITTLE BRITAIN
Town
LONDON
Country
UNITED KINGDOM
Postcode
EC5 4AZ

Fig.5B.

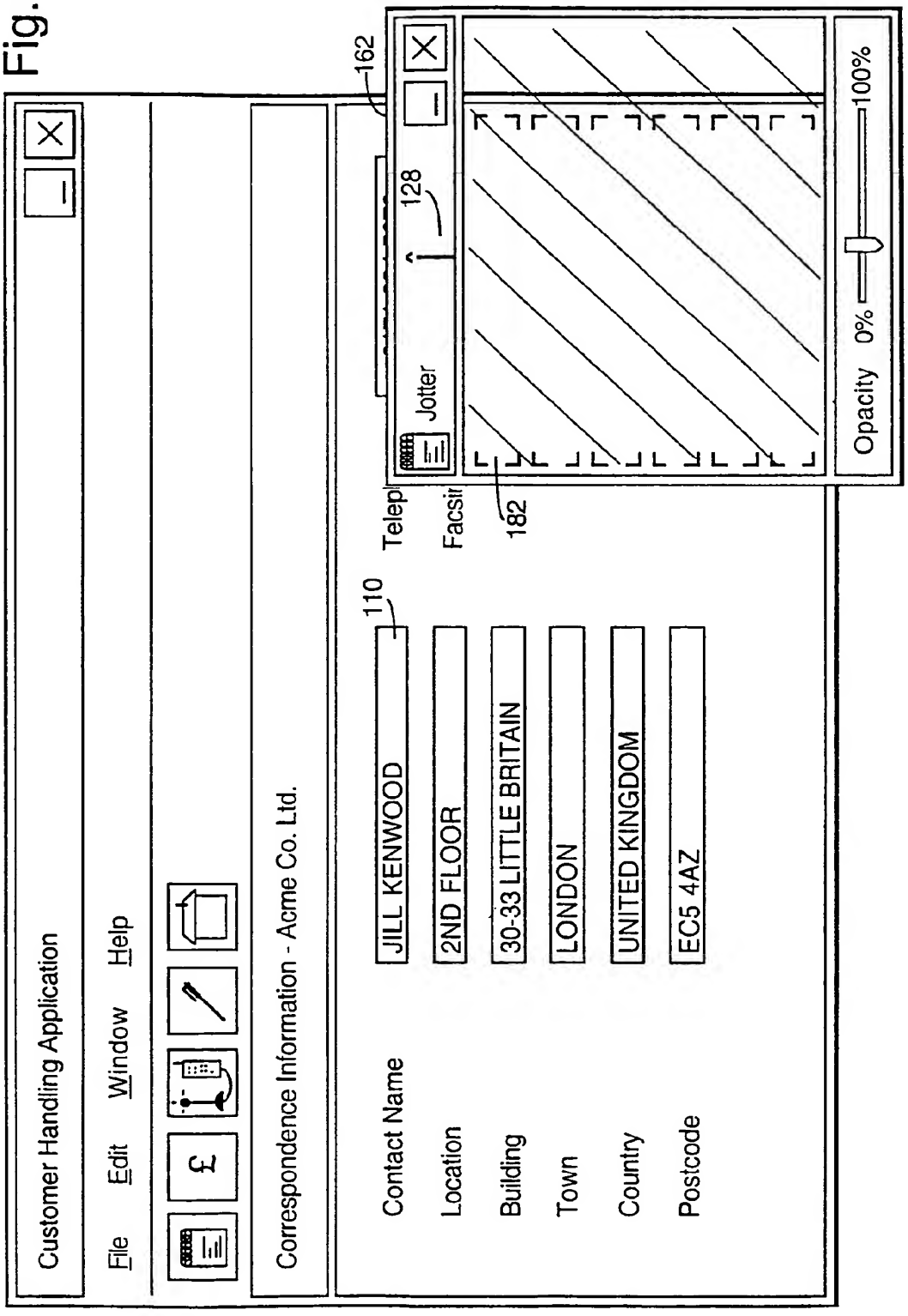

Customer Handling Application
File Edit Window Help
Correspondence Information - Acme Co. Ltd.
Contact Name
Location
Building
Town
Country
Postcode
JILL KENWOOD
2ND FLOOR
30-33 LITTLE BRITAIN
LONDON
UNITED KINGDOM
EC5 4AZ
110
Telep
Facsir
182
162
128
Jotter
Opacity 0%
100%

Fig.5C.

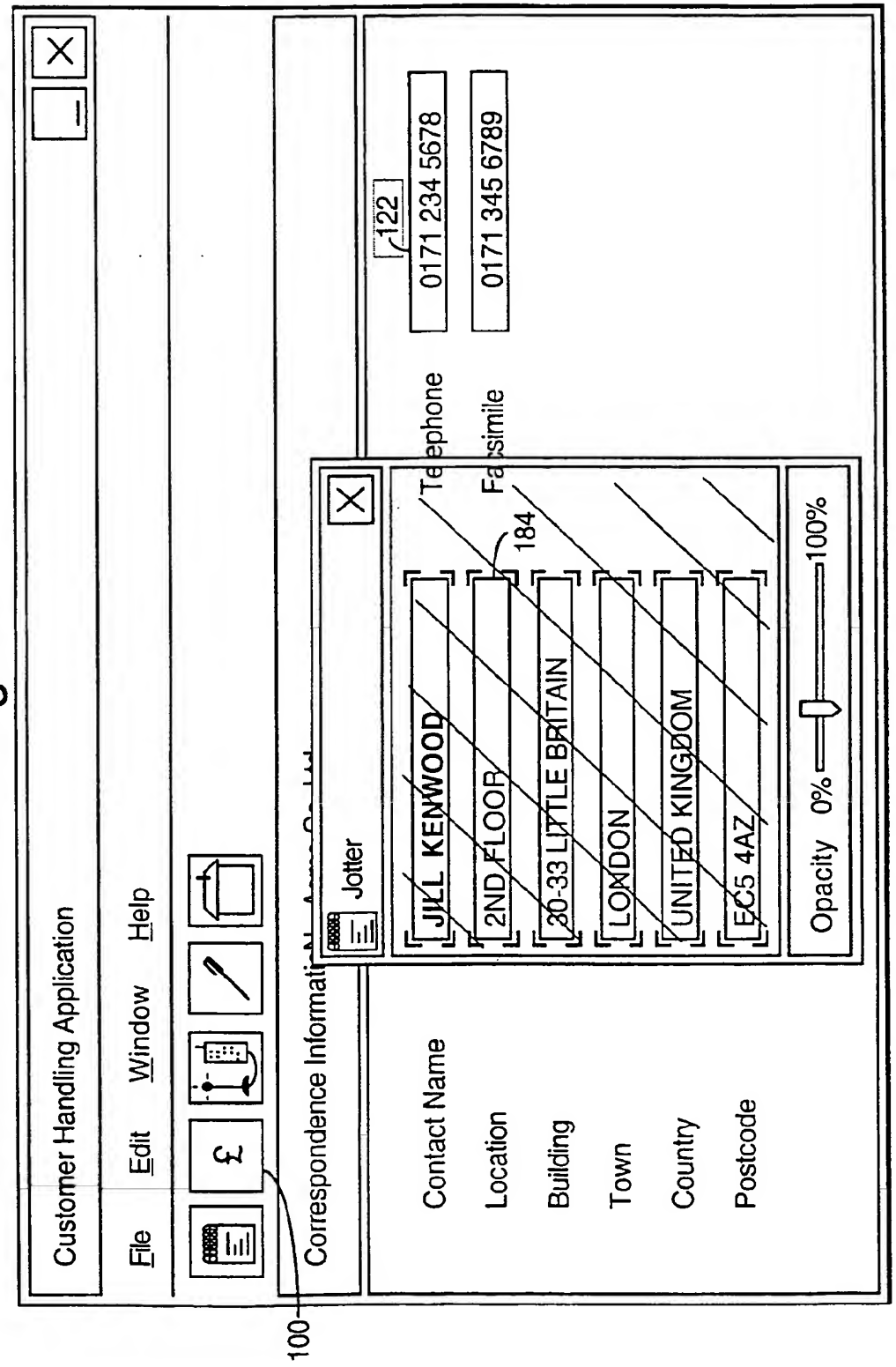
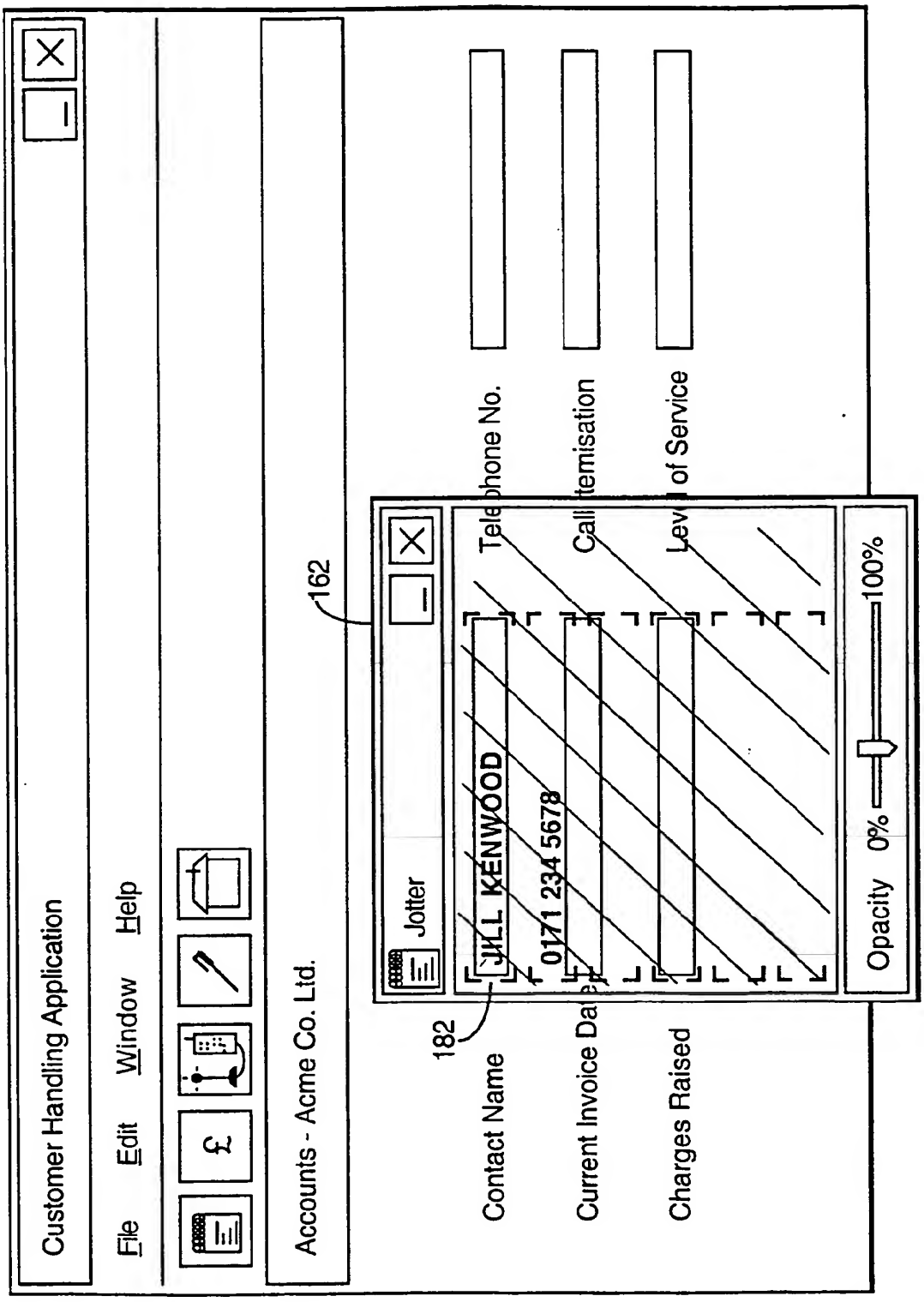

Customer Handling Application
File
Edit
Window
Help
100
Correspondence Informati
Jotter
Contact Name
Location
Building
Town
Country
Postcode
JILL KENWOOD
2ND FLOOR
30-33 LITTLE BRITAIN
LONDON
UNITED KINGDOM
EC5 4AZ
184
122
Telephone
Facsimile
0171 234 5678
0171 345 6789
Opacity 0%
100%

Fig.5D.


Customer Handling Application
File
Edit
Window
Help
Accounts - Acme Co. Ltd.
162
Jotter
182
Contact Name
JILL KENWOOD
0171 234 5678
Current Invoice Da
Charges Raised
Telephone No.
Call Itemisation
Level of Service
Opacity 0%
100%